RECEIVED
CENTRAL FAX CENTER

DEC 20 2005

01-ASD-224 (GT)

IN THE UNITED STATES PATENT & TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPL. NO.	:	**10/060,121**
CONFIRMATION NO.:		**5887**
APPLICANTS	:	**ROBERT P. BENJEY**
TITLE	:	**METHOD AND SYSTEM FOR CONTROLLING LIQUID FUEL AND VAPOR FLOW DURING REFUELING OF A MOTOR VEHICLE FUEL TANK**
FILED	:	**January 31, 2002**
ART UNIT	:	**3753**
EXAMINER	:	**JOHN A. RIVELL**

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office (Fax (571) 273-8300 on December 20, 2005.

12/20/05
Date

Teresa Bonsall
Teresa Bonsall

APPEAL BRIEF

Sir:

In answer to the Notice of Appeal Final Office Action dated August 23, 2005, Appellant appeals the final rejection of claims 1-12.

EXTENSION OF TIME

A two-month extension of time is respectfully requested. Payment for the same may be charged to Deposit Account 05-0275.

I. Real party in interest

Eaton Corporation is the real party in interest.

II. Related appeals and interferences.

There are no related appeals or interferences of which Appellant is aware.

III. Status of claims.

Claims 1-12 are currently pending and stand finally rejected. Appellant therefore appeals the final rejection of claims 1-12.

IV. Status of amendments

Appellant filed an After Final Response on July 27, 2005 without amending the claims. The Examiner considered the response, but noted in an Advisory Action that Appellant's arguments do not place the application in condition for allowance.

V. Summary of claimed subject matter

Independent claim 1 is directed to a system 30 that controls the flow of liquid fuel and fuel vapor during refueling. The system includes a vent valve 34 that is disposed in the fuel tank 32 and that has an inlet communicating with the vapor dome in the tank and an outlet communicating with a remote vapor storage device 54, such as a canister. The system also includes a seal 45 disposed in the filler tube 40 to form a seal around the fuel nozzle 48, a recirculation conduit 60 with one end connected to admit fuel vapor into the filler tube downstream of the seal and another end connected to receive fuel vapor from the outlet of said vent valve. A neck portion 50 of the filler tube is sized to fit the fuel nozzle closely in an area downstream from the location where the recirculation conduit connects with the filler tube. This close fit between the fuel nozzle and the filler neck down stream from the recirculation conduit forms a dynamic seal about the liquid discharging from the nozzle (Figure 1; paragraphs 16-19).

Independent claim 7 is directed to a method of controlling flow of liquid fuel and fuel vapor during refueling. The method includes the steps of disposing a fuel vapor vent valve 34, 92 in the fuel tank 32, 72, communicating the valve inlet with the vapor dome in the interior of the tank and communicating the vent valve outlet to a fuel vapor storage device 98, such as a canister. The method also includes disposing a seal 45, 84 for sealing around a fuel nozzle 48, 86 in the filler tube and recirculating fuel vapor to the filler tube at a location downstream of the nozzle seal. The method sizes the neck portion 50, 104 of

the filler tube so that fuel flowing from the nozzle forms a dynamic seal with the inner surface of the filler neck (Figures 1 and 4, paragraphs 16-19 and paragraphs 28-32).

Independent claim 11 is directed to a system that controls liquid fuel and fuel vapor during refilling. The system includes a vent valve 34 that is disposed in the fuel tank wall 37 and that has an inlet communicating with the vapor dome in the tank and an outlet communicating with a remote vapor storage device 54, such as a canister. The system also includes a one-way valve 62 that is operatively connected to admit vapor to the filler tube 40 from a conduit 60. A portion of the filler tube 50 downstream from the area at which the one-way valve connects to the filler tube has a reduced area to create a dynamic seal with fuel discharging from a fuel nozzle 48, and a seal is disposed upstream to seal around the fuel nozzle (Figures 1 and 2, paragraphs 16-27).

VI. Grounds of rejection to be reviewed on appeal

Claims 1-12 were finally rejected by the Examiner. Consequently, the issue in this appear is whether apparatus claims 1-12 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,606,954 to Yamazaki et al. ("Yamazaki") in view of U.S. Patent No. 5,183,087 to Aubel et al. ("Aubel") and U.S. Patent No. 5,769,057 to Hashimoto et al. ("Hashimoto"); and

VII. Arguments

The Examiner finally rejected claims 1-12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,606,954 to Yamazaki et al. ("Yamazaki") in view of U.S. Patent No. 5,183,087 to Aubel et al. ("Aubel") and U.S. Patent No. 5,769,057 to Hashimoto et al. ("Hashimoto").

In the final rejection, the Examiner admitted that Yamazaki does not show the claimed seal and neck portion, but asserted that it would have been obvious to incorporate the filler neck seal element 24 of Aubel and the closely-fitting filler tube neck portion 22' of Hashimoto to render the claimed invention obvious. Appellant respectfully disagrees.

As Appellant noted during prosecution, there is no motivation to combine Yamazaki with Aubel or Hashimoto because doing so would render Yamazaki unsatisfactory for its intended purpose. As noted in MPEP 2143.01, "if the proposed modification would render

the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." Further, "a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." MPEP 2141.02. The Examiner asserted in the Advisory Action that Appellant's arguments were not consistent with the precedent relied upon, but the arguments below will clearly show that MPEP 2143.01 and 2141.01 are both applicable to this case.

First, there is no motivation to incorporate the filler neck seal element 24 of Aubel into the Yamazaki system because doing so would render Yamazaki non-functional. As is known in the art, the amount and pressure of fuel vapor in the recirculation line must be carefully controlled so that air that is drawn into the filler tube by rushing fuel will pull the vapor back down into the tank rather than into the canister or out to the atmosphere. If there is too much fuel vapor, then excess vapor will leak into the atmosphere and cause the system to fail government emissions tests. If there is too little vapor or if a vacuum forms around the fuel nozzle, however, the interruption in vapor flow around the fuel nozzle will cause the nozzle to shut off prematurely (see, e.g., Aubel at col. 1, line 62 to col. 2, line 2).

One of ordinary skill in the art would not have incorporated Aubel's vapor-tight seal 24 into Yamazaki's filler tube 22' because doing so would prevent outside air from being drawn in with the rushing fuel to regulate the amount of fuel vapor in the filler neck. The recirculation line 27_1 in Yamazaki is restricted to limit the amount of fuel vapor directed to a negative pressure inducing hole 3a in the fuel nozzle 3 (col. 5, lines 3-48). The diameter of the recirculation line is carefully selected to limit the amount of fuel vapor so that any vapor that is not drawn into the hole is prevented from escaping to the atmosphere (col. 5, lines 50-55).

Aubel's seal would interfere with the amount of fuel vapor generated in the filler neck because the seal is designed to prevent vapor from escaping (col. 3, lines 22-26). If Aubel's pressure-tight seal were incorporated into the filler neck in Yamazaki, outside air would be blocked from being drawn in along with the rushing fuel, thereby creating a vacuum around the pressure inducing hole 3a of Yamazaki. This pressure drop would, in turn, shut off the nozzle prematurely. In other words, placing the seal in Aubel into the filler neck of Yamazaki would render Yamazaki unsatisfactory for its intended purpose.

Second, Yamazaki explicitly teaches away from incorporating any type of seal in the filler neck. The entire purpose of Yamazaki's design is to avoid putting a seal in the filler neck because Yamazaki views seals as lacking durability and reliability (see, e.g., Abstract; col. 1, lines 12-24). This teaching would have led one of ordinary skill in the art to avoid combining Yamazaki with a reference teaching a seal (e.g., Aubel).

Third, there is no motivation to combine Yamazaki and Aubel with Hashimoto because modifying the dimensions of the filler neck as taught in Hashimoto doing so would upset the balance between drawn air and fuel vapor, again either causing premature nozzle shut-off or escaping fuel vapors. Like Yamazaki, Hashimoto requires a specific selected amount of air to be drawn into the filler tube 3 during refilling to create negative pressure without causing premature nozzle shut-off (col. 7, lines 26-46). Changing the filler neck dimensions in Yamazaki's system as well as adding Aubel's seal would cause the nozzle in Yamazaki to shut off even more prematurely because the reduced size of the filler neck would provide even less air in the filler neck, causing a vacuum to form in the hole 3a in the nozzle even more quickly.

Thus, there is no motivation to combine Yamazaki, Aubel and Hashimoto in the manner suggested by the Examiner. For the reasons explained above, the Examiner fails to establish a prima facie case of obviousness with respect to apparatus claims 1-12, and therefore the final rejection should be withdrawn.

Conclusion

For the reasons stated above, the final rejection of claims 1-12 is improper and should be withdrawn. Appellant respectfully requests a Board decision to that effect.

01-ASD-224 (GT)

VII. Claims appendix

1. A system for controlling flow of liquid fuel and vapor during refueling of a motor vehicle fuel tank with a filler tube for receiving a fuel dispensing nozzle comprising:
   (a) a vent valve disposed in the tank and having an inlet communicating with the vapor dome in the tank and an outlet communicating with a remote vapor storage device;
   (b) a seal disposed in the filler tube and operable for sealing about the nozzle upon insertion therein;
   (c) a recirculation conduit having one end connected to admit fuel vapor to the filler tube at a location downstream of the seal and having an end opposite said one end connected to receive fuel vapor from the outlet of said vent valve; and,
   (d) a neck portion in the filler tube downstream of the location of said recirculation conduit connection location, wherein said neck has the inner periphery thereof sized to receive the nozzle in closely fitting arrangement and to form an effective dynamic seal about liquid discharging from the nozzle.

2. The system defined in claim 1, wherein said recirculation conduit includes a one-way valve .

3. The system defined in claim 1, wherein said vent valve outlet is connected to a hose connected to said storage device; and, said recirculation conduit has an end thereof connected to said hose.

4. The system defined in claim 1, wherein said recirculation conduit has one end connected through the wall of the tank and an end opposite said one end connected to said filler tube at said location.

5. The system defined in claim 1, wherein said vent valve is float operated.

01-ASD-224 (GT)

6. The system defined in claim 1, wherein said neck portion has its inner diameter sized about 1.2 times the nozzle diameter.

7. A method of controlling flow of liquid fuel and fuel vapor during refueling from a dispensing nozzle of a vehicle fuel tank having a filler tube comprising:

(a) disposing a fuel vapor vent valve with the tank and communicating the valve inlet with the vapor dome in the interior of the tank and communicating the vent valve outlet to a fuel vapor storage device;

(b) disposing a seal in the filler tube for sealing about the dispensing nozzle upon insertion in the filler tube;

(c) recirculating fuel vapor to the filler tube at a location downstream of the nozzle seal; and,

(d) sizing a neck portion of the filler tube for effecting a dynamic seal between the inner surface of the said neck portion and fuel discharging from the nozzle.

8. The method defined in claim 7, wherein said step of communicating the vent valve outlet includes connecting a hose from the valve outlet to the storage device; and, said step of recirculating includes connecting a line from the hose to the filler tube at said location.

9. The method defined in claim 7, wherein said step of recirculating includes connecting one end of a conduit through the tank wall and connecting an end opposite the one end to the filler tube at said location.

10. The method defined in claim 7, wherein the step sizing a portion of the filler tube includes sizing the inner diameter of the portion about 1.2 times the nozzle diameter.

11. A system for controlling flow of liquid fuel and vapor during refueling from a refueling nozzle of a motor vehicle fuel tank with a filler tube comprising:

(a) a vent valve disposed in the tank wall and having an inlet communicating with the vapor dome in the tank and an outlet communicating with a remote vapor storage device;

(b) a one-way valve operatively connected to admit vapor to the filler tube from the first conduit;

(c) a reduced portion of said filler tube downstream of the location at which said one-way valve is connected to the filler tube, said reduced portion sized for effecting a dynamic seal with fuel discharging from the nozzle; and,

(d) a seal about said nozzle disposed upstream.

12. (Original) The system defined in claim 11, wherein the inner diameter of said reduced portion of said filler tube is sized in the range of about 1.2 times the nozzle diameter.

01-ASD-224 (GT)

IX. Evidence appendix.

Not applicable

X. Related proceedings appendix

Not applicable

Respectfully submitted,

Dated: 12/20/05

Anna M. Shih
Registration No. 36,372
Eaton Corporation
26201 Northwestern Hwy.
P. O. Box 766
Southfield, MI 48037
(248) 226-6821